Claims:

1. A method comprising:

detecting a weak link component in the wireless communication link;

introducing multidimensional diversity into at least the weak link component to generate a plurality of decorrelated signals associated with the weak link component; and

selectively combining received ones of the plurality of decorrelated signals which, when demodulated, provides a representation of content originally transmitted in the received signal(s).

2. A method according to claim 1, wherein detecting a weak link component comprises:

monitoring one or more operational characteristics of each of an uplink and downlink component of a wireless communication link; and

comparing the monitored characteristic(s) against a threshold associated with each of the one or more characteristics.

3. A method according to claim 2, wherein the monitored one or more operational characteristics include one or more of a receive signal strength, a signal to noise ratio (SNR), a bit error rate (BER), a frame error rate (FER), signal to noise and interference ratio (SINR), and/or a carrier to interference ratio (CIR).

4. A method according to claim 1, wherein multidimensional diversity includes diversity in two or more of the space, time and/or frequency domains.

5. A method according to claim 1, wherein introducing multidimensional diversity comprises:

determining whether an additional channel is available to support repetition coding of the weak link component; and

invoking repetition coding in at least the weak link component to provide channel diversity.

6. A method according to claim 5, wherein a channel is a timeslot on a particular carrier frequency.

7. A method according to claim 5, further comprising:

introducing frequency diversity in the repetition-coded signal, wherein each timeslot is dynamically assigned to an independent carrier frequency.

8. A method according to claim 5, wherein determining whether an additional channel is available comprises determining whether a timeslot is available to support repetition coding.

9. A method according to claim 5, wherein introducing multidimensional diversity further comprises:

enabling receipt of the weak link component via multiple channels and multiple receive paths.

10. A method according to claim 9, wherein enabling receipt via multiple receive paths comprises:

receiving the weak link component through multiple antennae.

11. A method according to claim 9, wherein selectively combining comprises:

performing initial spatial processing on at least a temporally first channel by adding energy of each of the signals associated with the channel via the multiple receive paths to form a composite of such signals;

performing an error control check on the composite signal; and

combining spatially processed composite signals associated with each of the channels comprising the repetition coded weak link component if the error control check on the composite signal fails.

12. A method according to claim 11, wherein spatial processing comprises:

combining each spatially diverse signal representation of the channel received from the multiple receive paths utilizing maximal ratio combining (MRC).

13. A method according to claim 11, wherein the error control check comprises:

demodulating the composite signal;

extracting error control information from at least a subset of the demodulated signal; and

performing a cyclical redundancy check (CRC) using the error control information to determine whether the demodulated signal matches an originally encoded signal.

14. A method according to claim 11, wherein combining spatially processed composite signals comprises:

receiving each of the spatially processed composite signals associated with each channel of the repetition coded weak link component; and

combining the spatially composite signals utilizing maximal ratio combining (MRC) to generate a best estimate of the signal transmitted via the weak link component.

15. A storage medium comprising a plurality of machine executable instructions which, when executed, implement a method according to claim 1.

16. A wireless communication system element comprising:

a transceiver with which to establish a wireless communication link with a different element to facilitate a wireless communication session; and

a multidimensional diversity agent, coupled to the transceiver, to selectively introduce multidimensional diversity into at least an identified weak link component to generate a plurality of decorrelated signals associated with the weak link component, and to selectively combine received ones of the plurality of decorrelated signals which, when demodulated, provide a representation of content originally transmitted in the received signals.

17. A wireless communication system element according to claim 16, wherein the system element is a communication station, and the different element is a subscriber unit.

18. A wireless communication system element according to claim 16, wherein the system element is a subscriber unit, and the different element is a communication station.

19. A wireless communication system element according to claim 16, wherein the multidimensional diversity agent monitors one or more operational characteristics of the wireless communication link to determine whether to invoke multidimensional diversity.

20. A wireless communication system element according to claim 19, wherein the monitored one or more operational characteristics include one or more of a receive signal strength, a signal to noise ratio (SNR), a bit error rate (BER), a frame error rate (FER), signal to noise and interference ratio (SINR), and/or a carrier to interference ratio (CIR).

21. A wireless communication system element according to claim 19, wherein multidimensional diversity agent selectively introduces diversity in one or more of a space, time and/or frequency domains.

22. A wireless communication system element according to claim 16, the transceiver comprising:

a plurality of first stage channel processors, each associated with a communication channel, wherein each generate a spatial composite signal from a plurality of spatially decorrelated signal(s) received from one or more antenna(s) coupled to the system element; and

at least one second stage channel processor, coupled to the first stage channel processors to receive at least the spatial composite signal from each of the first stage channel processor(s) perform additional processing and to route the signals to appropriate other network elements to facilitate the communication session.

23. A wireless communication system element according to claim 22, wherein spatial processing includes maximal ratio combining (MRC) of the received spatially diverse signals to generate a spatial composite of such received signals.

24. A wireless communication system element according to claim 22, wherein the first stage processors demodulate the spatial composite to perform an error check, wherein a positive error check denotes that the transmitted signal has been accurately received and further combination with other dimensionally decorrelated signals is unnecessary.

25. A wireless communication system element according to claim 24, wherein the diversity agent introduces channel diversity in one or more of the wireless communication links if a weak link component is identified.

26. A wireless communication system element according to claim 25, wherein diversity agent invokes repetition coding in at least a transmitter of the weak link component to redundantly transmit conversational content on at least two channels providing temporally diverse signals.

27. A wireless communication system element according to claim 26, wherein a channel is defined as a timeslot-frequency pair.

28. A wireless communication system element according to claim 27, wherein diversity agent instructs the second stage channel processor to forward the spatial composite signal from a temporally first channel processor associated with the weak link

component to a subsequent channel processor associated with the weak link component for further processing on the spatial composite signals.

29. A wireless communication system element according to claim 28, wherein the subsequent channel processor combines its spatial composite signal with a temporally diverse spatial composite received from the temporally first channel processor via the second stage channel processor.

30. A wireless communication system element according to claim 29, wherein the subsequent channel processor utilizes maximal ratio combining (MRC) to process the temporally diverse spatial composite signals.

31. A wireless communication system element according to claim 27, wherein each of the channels is dynamically assigned to an independent carrier frequency, providing frequency diverse signals.

32. A wireless communication system element according to claim 27, wherein diversity agent instructs each of channel processor associated with the weak link component to submit its spatial composite signal to the second stage channel processor, which combines the spatial composite from the temporally first channel processor with temporally diverse spatial composite(s) from one or more additional channel processor(s) associated with the weak link component to generate a representation of an originally transmitted signal.

33. A wireless communication system according to claim 32, wherein each of the channels is assigned to an independent carrier frequency, providing frequency diverse signals.

34. A wireless communication system element according to claim 16, further comprising:

control logic, to control one or more operational aspects of the wireless communication system element; and

a memory device, coupled to the control logic, including a plurality of executable instructions which, when executed by the control logic, implement one or more functions of the multidimensional diversity agent.

35. A machine accessible storage device comprising a plurality of executable instructions which, when executed by an accessing machine, implement a multidimensional diversity agent to selectively introduce multidimensional diversity into at least an identified weak link component of a wireless communication link to generate a plurality of decorrelated signals in at least the weak link component, and to selectively combine received ones of the plurality of decorrelated signals which, when demodulated, provide a representation of content originally transmitted in the received signals.

36. A machine accessible storage device according to claim 35, further comprising instructions which, when executed, cause the executing machine to monitor one or more operational characteristics of the wireless communication link for an indication of weakness in one or more of the link components.

37. A machine accessible storage device according to claim 36, wherein the instructions cause the machine to monitor one or more of a receive signal strength, a signal to noise ratio (SNR), a bit error rate (BER), a frame error rate (FER), signal to noise and interference ratio (SINR), and/or a carrier to interference ratio (CIR).

38. A machine accessible storage device according to claim 35, wherein the diversity agent causes an executing machine to issue an instruction to a transmitter of the identified weak link component to invoke repetition coding, introducing temporally diverse signals into at least the weak link component.

39. A machine accessible storage device according to claim 38, wherein the instructions to implement the diversity agent cause the executing machine to combine spatially diverse signals to generate a spatial composite within each channel associated with a weak link component, and to combine the spatial composites for each temporally diverse channel to generate a representation of the originally transmitted signal.

40. A machine accessible storage device according to claim 39, wherein the instructions to implement the diversity agent cause the executing machine to only combine the spatial composites when an error check of demodulated spatial composites associated with the temporally diverse channels fail.